



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/791,099	03/01/2004	Eric Chen-Li Sheng	TRAN-P283	2474

7590 05/25/2006
WAGNER, MURABITO & HAO LLP
Third Floor
Two North Market Street
San Jose, CA 95113

EXAMINER

SUN, XIUQIN

ART UNIT PAPER NUMBER

2863

DATE MAILED: 05/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/791,099	Applicant(s) SHENG ET AL.	
	Examiner Xiuqin Sun	Art Unit 2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 March 2006.
 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 1-33 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☒ The drawing(s) filed on 01 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Upon further consideration, the allowable subject matter of claim 16 as indicated in the last Office Action mailed on 11/28/2005 has been withdrawn. Any inconvenience to the Applicant(s) is regretted.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claim 15-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Pullen et al. (U.S. Pub. No. 20050240844).

With respect to claim 15, Pullen et al. disclose a computer implemented method of determining a junction temperature of an integrated circuit, said method comprising: measuring an ambient temperature in a region proximate to said integrated circuit (sections 0069-0072); measuring electrical power utilized by said integrated circuit (section 0069-0072); accessing a thermal resistance value for said integrated circuit; and said thermal resistance value is accessed from a computer usable media (section

0073); and determining a junction temperature of said integrated circuit (sections 0069-0075).

With respect to claim 16, Pullen et al. further disclose: said determining comprises multiplying said thermal resistance value by said electrical power and adding said ambient temperature (section 0070).

With respect to claim 17, Pullen et al. further disclose: said measuring electrical power comprises measuring current to said integrated circuit (section 0094).

With respect to claim 18, Pullen et al. further disclose: said thermal resistance value is accessed from a computer usable media (section 0073).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-14, 19-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ando (U.S. Pub. No. 20040111231) in view of Cohen et al. (U.S. Pub. No. 20050088137).

With respect to claims 1, 8 and 27, Ando teaches a computer-implemented method and computer software program that implements the method of reducing temperature variation among integrated circuits during burn-in testing, comprising:

measuring an ambient temperature associated with said integrated circuit under test (section 0035); and adjusting a body bias voltage of said integrated circuit under test to achieve a desired operating condition of said integrated circuit under test (section 0035).

Ando does not mention expressly: measuring power consumed by an integrated circuit under test; said desired operating condition is a desired junction temperature.

Cohen et al. teach measuring power consumed by an integrated circuit under test; and used the measured power consumption to optimize voltage and frequency control to achieve a desired junction temperature of said integrated circuit (Fig. 1; sections 0016, 0018 and 0021).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Cohen et al. in the invention of Ando in order to take into account the impact of power consumption as a controlling factor in optimizing the performance, which is evaluated in terms of desired junction temperature, of said integrated circuit (Abstract and section 0021).

With respect to claims 2, 3, 5-7, 9, 10, 12-14, 26, 28, 29 and 31-33, Ando further teaches: said ambient temperature is measured for a region comprising only said integrated circuit under test (sections 0019 and 0035); said ambient temperature is measured for a region comprising more than one integrated circuits under test (sections 0019 and 0035); an operating voltage of said integrated circuit under test remains fixed during said measuring and said adjusting (section 0033); said body bias voltage is individually controllable for said integrated circuit under test (section 0035); said

integrated circuit under test comprises body-biasing well structures to accept said body bias voltage (section 0020); and said method implemented by said test controller also comprises stimulating said integrated circuit for testing (section 0025).

With respect to claim 19, Ando teaches a system for testing an integrated circuit comprising: an operating voltage supply for coupling said integrated circuit (sections 0019 and 0020); a body bias voltage supply for coupling said integrated circuit for providing a body bias voltage (sections 0019 and 0020); an ambient temperature sensor for determining an ambient temperature for a region proximate to said integrated circuit (section 0035); a test controller for coupling said integrated circuit, said bias voltage supply and said ambient temperature sensor, said test controller for implementing a method for reducing temperature variation among an integrated circuit during burn-in testing (sections 0019, 0020, 0035), said method comprising: accessing a measure of ambient temperature associated with said integrated circuit (section 0035); and adjusting said body bias voltage of said integrated circuit to achieve a desired operating condition of said integrated circuit (section 0035).

Ando does not mention expressly a current measuring device for coupling said integrated circuit for measuring operating current of said integrated circuit; accessing a measure of power consumed by said integrated circuit; said desired operating condition is a desired junction temperature.

Cohen et al. teach: a current measuring device for coupling said integrated circuit for measuring operating current of said integrated circuit (sections 0017 and 0021); measuring power consumed by an integrated circuit under test; and used the measured

power consumption to optimize voltage and frequency control to achieve a desired junction temperature of said integrated circuit (sections 0016, 0018 and 0021).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Cohen et al. in the invention of Ando in order to take into account the impact of power consumption as a controlling factor in optimizing the performance, which is evaluated in terms of desired junction temperature, of said integrated circuit (Abstract and section 0021).

With respect to claims 4, 11, 22 and 30, Ando teaches the method and system that includes the subject matter discussed above except: said measuring power comprises measuring current to said integrated circuit under test.

Cohen et al. teach: said measuring power comprises measuring current to said integrated circuit under test (sections 0017 and 0021).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Cohen et al. in the invention of Ando in order to take into account the impact of power consumption as a controlling factor in optimizing the performance, which is evaluated in terms of desired junction temperature, of said integrated circuit (Abstract and section 0021).

With respect to claims 20, 21 and 23-25, Ando further teaches: said ambient temperature is measured for a region comprising only said integrated circuit under test (sections 0019 and 0035); said ambient temperature is measured for a region comprising more than one integrated circuits under test (sections 0019 and 0035); an operating voltage of said integrated circuit under test remains fixed during said

measuring and said adjusting (section 0033); said body bias voltage is individually controllable for said integrated circuit under test (section 0035); said integrated circuit under test comprises body-biasing well structures to accept said body bias voltage (section 0020).

Prior Art Citations

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

1) Butler (U.S. Pub. No. 2004018867) is entitled "System for and method of assessing chip acceptability and increasing yield".

2) Fan (U.S. Pub. No. 20040083075) is entitled "Junction temperatures measurements in semiconductor chip package technology".

Response to Arguments

7. Applicant's arguments received 03/03/2006 with respect to claims 1-33 have been considered but are moot in view of the new ground(s) of rejection.

Claims 1-14 and 19-33 are rejected as new evidence has been found from the Cohen reference (U.S. Pub. No. 20050088137) to teach the limitation "measuring power consumed by an integrated circuit under test" and used the measured power consumption to optimize voltage and frequency control to "achieve a desired junction temperature of said integrated circuit" recited in independent claims 1, 8, 19 and 27 and

other limitations recited in the dependent claims. Detailed response is given in sections 2, 4 and 5 as set forth above in this office action.

Applicant argued that Ando fails to teach or fairly suggest the limitation "measuring an ambient temperature associated with said integrated circuit under test". This argument is not persuasive. The Examiner's position is that, giving the claims the broadest reasonable interpretation, the Ando reference does read on the claims. Applicants' reliance upon the specification in this regard is noted. However, the feature in the specification to which Applicant refers are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Claims 15-18 are rejected as new prior art reference (U.S. Pub. No. 20050240844 to Pullen et al.) has been found to teach the claimed invention. Detailed response is given in section 3 as set forth above in this office action.

Contact Information


8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Xiuqin Sun whose telephone number is (571)272-2280. The examiner can normally be reached on 6:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571)272-2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

XS

May 17, 2006


MICHAEL NGHIEM
PRIMARY EXAMINER

Xiuqin Sun
Examiner
Art Unit 2863